



Nederlandse
onderneming
voor
energie en
milieu b.v.

Review of PI applications in the process industries

Start of the guide “How to do PI”?

Netherlands agency for energy and the environment



***Dutch PI taskforce* formed 1997 -
platform for process industries,
engineering, institutions - Novem**

Challenge Dutch PI taskforce:

- **Facilitate next step in energy reduction in the process industries**
- **Contribute in the development and application of new technology**

PI taskforce activities:

- spread of PI **know how**, concepts and success stories
- **studies**, trace and stimulate technology
- methods **process analysis and process synthesis**
- trace, develop and “**sell**” new technology
- stimulate **projects** in process industries

PI projects in process industry NL

- **at least 10 projects completed - NOVEM support - specific results confidential**
- **process systems engineering applied**
- **results show less capital and energy, say - 30%**
- **stimulated by PIN NL program**
- **highlights presented at PI symposium**
- **NPT publication 2001 March/April**
- **ongoing in PIN NL meetings**



“How to do PI” guide

Objective: Use know how available for general purpose to stimulate other process industries

Set up prepared, **roadblock: confidential process info difficult to share - technology+strategy**



How to do PI guide

- **Why PI, drivers + opportunities**
- **Definition, vision processes**
- **Studies - equipment, fundamentals, POA + PSE methods**
- **Cases process industries**
- **Facilities - organizations, contacts**
- **Criteria for success**

“How to do”=addition to PI guide UK

2nd: Review of PI process applications

- **List + contact owners**
- **Analyze - technology + strategy**
- **Learning effects**
- **Communicate results at 5th PI Conference**

Info from:

- **Proceedings of four International PI Conferences**
- **PIN NL meetings + symposia**
- **Contacts**

5th PI Conference Maastricht October '03

Plan:

- **Review of PI process applications**
- **Process industries NL, case PI applications**
- **Training course ?**

PI - Andrzej Stankiewicz

Process Synthesis - Henk van den Berg

PIN NL 2001 meetings May+October:

- **HIDIC columns - TUD, Jansens**
- **Reverse flow reactor - PhD studies Twente**
- **Heat exchanger-reactor - DSM**
- **Transient reactor systems - TUE, Schouten**
- **New caprolactam process - DSM**
- **Pervaporation using ceramic membranes - Akzo Nobel**
- **25 and 20 participants**

PIN NL 2002 May 2 meeting:

- **Dautzenberg - multi functional reactors**
- **Novem M&T, PI project - Forbo linoleum**
- **students Simon Stevin TUE report USA PI trip**

10 October '02: KNCV Consultancy+PIN NL

- **Stankiewicz - DSM bluePRINT project**
- **Novem taskforces - de Vries**
- **PIN NL activities - van den Berg**
- **Extruder-reactor - Kappen/ATO**
- **Batch->continue - Kraaijveld/TNO**
- **Reactive separations - Gorissen/Akzo Nobel**

Conclusion

- **Processes will change, stimulated by new challenges, application of new technologies and new visions**
- **PI concepts can make things happen**
- **PI technology + process analysis and process synthesis to be spread**
- **PI concepts in the toolbox of each process engineer - between the ears !**

PI - just do it !